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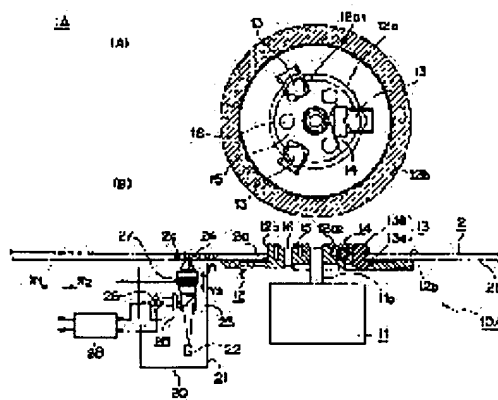
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(54) CHUCKING DEVICE TO TURNTABLE OF OPTICAL DISK

(57)Abstract:

PURPOSE: To surely chuck an optical disk to a turntable.

CONSTITUTION: When the optical disk 2 is chucked to the turntable 12, a focusing servo is exerted to an objective lens 24 of an optical pickup 20 for reading the signal surface 2c of the optical disk 2 in the stopped state before rotating the optical disk 2. Then, a chucking decision circuit 28 is provided to decide that the chucking of the optical disk 2 to the turntable 12 is surely performed when the optical disk 2 is focalized to the signal surface 2c and that the optical disk is mis-chucked when the focusing can not be made.



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CLAIMS

[Claim(s)]

[Claim 1] Fitting of the central hole of an optical disk is carried out to the spindle section of the turntable by which a rotation drive is carried out. It is chucking equipment to the turntable of the optical disk which carries out chucking of said optical disk to said turntable by the clamper which presses the chucking pawl formed in this spindle section, or near the central hole of said optical disk. By operating a focus servo to the objective lens of the optical pickup for reading the signal side of said optical disk by the idle state before said optical disk which carried out chucking rotates. When the focus to the signal side of said optical disk is able to be taken, while judging with chucking to the turntable of said optical disk having been performed certainly. Chucking equipment to the turntable of the optical disk characterized by having a chucking judging means to judge with it being mistake chucking when said focus cannot be taken.

[Claim 2] Grasp the periphery section of an optical disk by the grasping member, equip a tray, and the spindle section of the turntable by which a rotation drive is carried out is made to carry out fitting of the central hole of said optical disk to said tray and one. It is chucking equipment to the turntable of the optical disk which carries out chucking of said optical disk to said turntable by the clamper which presses the chucking pawl formed in this spindle section, or near the central hole of said optical disk. By operating a focus servo to the objective lens of the optical pickup for reading the signal side of said optical disk by the idle state before said optical disk which carried out chucking to said tray and one rotates. When the focus to the signal side of said optical disk is able to be taken, while judging with chucking to the turntable of said optical disk having been performed certainly. It comes to have a chucking judging means to judge with it being mistake chucking when said focus cannot be taken. When it judges with chucking having been certainly performed by said chucking judging means, cancel grasping of said optical disk by said grasping member, and said tray is evacuated from said turntable. And chucking equipment to the turntable of the optical disk which repeats chucking again when it judges with it being mistake chucking, and is characterized by constituting so that abnormalities may be told, when it is mistake chucking also after the count repetition of predetermined.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the chucking equipment to the turntable of the optical disk which carries out chucking of the optical disk to a turntable certainly.

[0002]

[Description of the Prior Art] It is common knowledge for disc-like optical disks, such as a compact disk (CD), a ROM mold compact disk (CD-ROM), a interactive compact disc (CD-I), and a videodisk (VD), to be used briskly, and for these optical disks to change information signals, such as speech information, image information, and text, into two or more pit trains in the signal side which has the reflective film, and to have recorded so much in recent years. Moreover, these optical disks make the reflective film with the film the signal side engraved considering transparent resin material as a pedestal, further, on the reflective film, they carry out a protective coat with the film, and the transparent pedestal side is formed as a playback side.

[0003] Generally, the turntable within the well-known body of an optical disk driving gear is equipped, the high-speed revolution was carried out, and the above-mentioned optical disk has read the signal side by the optical pickup. Under the present circumstances, the optical disk is held by chucking equipment at the turntable so that an optical disk may escape from a turntable to a turntable and one and it may not appear in them, in order to carry out a high-speed revolution.

[0004] Drawing 8 is the sectional side elevation having shown an example of the chucking equipment to the turntable of the conventional optical disk, and drawing in which (A) showed the block diagram and (B) showed the normal chucking condition, and (C) are drawings having shown the mistake chucking condition.

[0005] Chucking equipment 100 to the turntable of the conventional optical disk shown in drawing 8 (A) It sets and is the body 110 of an optical disk driving gear. Inside, it is an optical disk 101. Motor 111 for carrying out high-speed revolution actuation It is a turntable 112 to shaft 111a. It has fixed. The above-mentioned turntable 112 Optical disk 101 Spindle section 112a and an optical disk 101 for central hole 101a to fit in It connects and has installation section 112b for laying playback side 101b, spindle section 112a projects above disc-like installation section 112b, and it is formed in the shape of a taper cylinder, and is a griddle 113 in the center section of spindle section 112a. It has fixed. Moreover, turntable 112 In the upper part, it is an optical disk 101. It is the upper part to the turntable 112 near the central hole 101a. Clamper 114 pressed to the installation section 112b side It is prepared free [vertical movement]. This clamper 114 In the center of the interior, it is a magnet 115. It has fixed. Moreover, turntable 112 In near, it is an optical disk 101. Optical pickup 116 for reading signal side 101c Optical disk 101 It is prepared in the direction of a path (an arrow head X1, X 2-way) free [straight-line migration].

[0006] And as shown in drawing 8 (B), it is an optical disk 101. Turntable 112 It is a clamper 114 from the upper part after carrying out fitting to spindle section 112a. Optical disk 101 If it is made to contact from the upper part near the central hole 101a Clamper 114 Magnet 115 which fixed inside Turntable

112 Griddle 113 which fixed to spindle section 112a Counter mutually and it attracts each other. Optical disk 101 It is a turntable 112 near the central hole 101a. Since it is pressed at the installation section 112b side, it is an optical disk 101. Turntable 112 It will be in the condition that chucking was carried out. At this time, it is an optical disk 101. Playback side 101b is a turntable 112. When it sticks to installation section 112b Optical disk 101 Turntable 112 It will be in the condition that chucking was carried out normally. Then, turntable 112 Even if it carries out the high-speed revolution of the optical disk 101 at one, it is an optical disk 101. Turntable 112 Since it does not escape from and come out of spindle section 112a Optical pickup 116 Optical disk 101 Signal side 101c can be read certainly. [0007]

[Problem(s) to be Solved by the Invention] By the way, as shown in drawing 8 (C), it is an optical disk 101. It is a turntable 112 about central hole 101a. When fitting is carried out in the condition of having hooked on spindle section 112a aslant, it is an optical disk 101. Playback side 101b is a table 112. Touch with installation section 112b is lost in part, and, thereby, it is an optical disk 101. Turntable 112 It will be in the condition that mistake chucking was carried out. This condition that mistake chucking was carried out is an optical disk 101 by the help. Turntable 112 In being generated artificially [when it equips] ****, it is an optical disk 101 by the optical disk automatic gun charger (not shown). Turntable 112 It may be generated mechanically [also when self-chambering is carried out], and it is not told that mistake chucking has usually produced the user in such a case, but it is an optical disk 101 promptly. It will shift to the actuation to read. However, even if mistake chucking has arisen, it is the body 110 of an optical disk driving gear. Inside, it is an optical disk 101. Since the high-speed revolution has already been carried out, it is an optical disk 101. Turntable 112 It escapes from and comes out of spindle section 112a, and is the expensive optical disk 101. In damage ****, it is the body 110 of equipment. Problems, such as hurting one's inner configuration member, occur. Of course, optical disk 101 Turntable 112 Although it does not escape from and come out of spindle section 112a, it is an optical pickup 116. Optical disk 101 It may happen, when signal side 101c cannot be read. Under the present circumstances, a user judges whether mistake chucking has arisen very much, when neither voice nor an image is outputted.

[0008] Then, when chucking of the optical disk is carried out to a turntable, before carrying out the high-speed revolution of the optical disk, chucking equipment to the turntable of the optical disk which can tell the user or body side of an optical disk driving gear about a mistake chucking condition is desired.

[0009]

[Means for Solving the Problem] This invention is made in view of the above-mentioned technical problem. The 1st invention Fitting of the central hole of an optical disk is carried out to the spindle section of the turntable by which revolution actuation is carried out. It is chucking equipment to the turntable of the optical disk which carries out chucking of said optical disk to said turntable by the clamber which presses the chucking pawl formed in this spindle section, or near the central hole of said optical disk. By operating a focus servo to the objective lens of the optical pickup for reading the signal side of said optical disk by the idle state before said optical disk which carried out chucking rotates When the focus to the signal side of said optical disk is able to be taken, while judging with chucking to the turntable of said optical disk having been performed certainly When said focus cannot be taken, it is chucking equipment to the turntable of the optical disk characterized by having a chucking judging means to judge with it being mistake chucking.

[0010] Moreover, the 2nd invention grasps the periphery section of an optical disk by the grasping member, and equips a tray with it. The spindle section of the turntable by which revolution actuation is carried out is made to carry out fitting of the central hole of said optical disk to said tray and one. It is chucking equipment to the turntable of the optical disk which carries out chucking of said optical disk to said turntable by the clamber which presses the chucking pawl formed in this spindle section, or near the central hole of said optical disk. By operating a focus servo to the objective lens of the optical pickup for reading the signal side of said optical disk by the idle state before said optical disk which carried out chucking to said tray and one rotates When the focus to the signal side of said optical disk is able to be taken, while judging with chucking to the turntable of said optical disk having been performed certainly

It comes to have a chucking judging means to judge with it being mistake chucking when said focus cannot be taken. When it judges with chucking having been certainly performed by said chucking judging means, cancel grasping of said optical disk by said grasping member, and said tray is evacuated from said turntable. And when it judges with it being mistake chucking, chucking is repeated again, and when it is mistake chucking also after the count repetition of predetermined, it is chucking equipment to the turntable of the optical disk characterized by constituting so that abnormalities may be told.

[0011]

[Example] The example of the chucking equipment to the turntable of the optical disk concerning this invention is explained with reference to drawing 1 thru/or drawing 7 below at a detail in order of <the 1st example>, the <2nd example>, and the <3rd example>.

[0012] The sectional side elevation having shown the chucking equipment to the turntable of the optical disk of the 1st example concerning this invention in <1st example> drawing 1, drawing having shown the focal property of an optical pickup which showed drawing 2 in drawing 1, and drawing 3 are the mimetic diagrams for explaining actuation of the chucking equipment to the turntable of the optical disk of this 1st example, and drawing in which (A) showed the normal chucking condition, and (B) are drawings having shown the mistake chucking condition.

[0013] In chucking equipment 1A to the turntable of the optical disk of the 1st example concerning this invention shown in drawing 1 (A) and (B), the turntable 12 has fixed the optical disk 2 in body of optical disk driving gear 10A at shaft 11a of the motor 11 for carrying out high-speed revolution actuation.

[0014] Central hole 2a of an optical disk 2, spindle section 12a which fits in, and installation section 12b which lays playback side 2b of an optical disk 2 connect the above-mentioned turntable 12, and it is formed. Moreover, spindle section 12a projects above disc-like installation section 12b, and is formed in the shape of a taper cylinder, and very minute irregularity is formed in the flat field at the periphery of installation section 12b so that it may not slide while an optical disk 2 rotates.

[0015] Moreover, in the U-shaped notching section 12a1 which about 3 etc. carried out the part of the periphery section of spindle section 12a, and formed it as a disk chucking means of thin form structure, three chucking pawls 13 are energized elastically and formed free [an attitude] to the periphery section of spindle section 12a. This chucking pawl 13 is energized by the elastic members 14 inserted into the U-shaped notching section 12a1 and the crevice 12a2 with a stage formed successively, such as rubber, so that central hole 2a of an optical disk 2 may always be pressed, and it projects from the periphery section of spindle section 12a by them. In addition, although the rubber cut to predetermined die length with a circular cross section is used in the example as illustrated as an elastic member 14, the spring material in which elastic displacement of a compression spring, a flat spring, etc. is free may be used, without restricting to this. Furthermore, there is also the approach of forming an elastic member 14 as a direct chucking pawl.

[0016] Moreover, the upper part of the chucking pawl 13 attaches a disk 15 in the top face of spindle section 12a through a pin 16, and he is trying for the chucking pawl 13 not to separate from it up. Furthermore, crevice 13a is formed near the installation section 12b, it connects [a / this / crevice 13], and up, it is easy to insert central hole 2a of an optical disk 2, and lobe 13b from which inserted central hole 2a cannot escape easily is formed in the chucking pawl 13 which projected from the periphery section of spindle section 12a. Therefore, if central hole 2a of an optical disk 2 fits into spindle section 12a, since it entered into crevice 13a of the chucking pawl 13 according to the energization force of an elastic member 14 and this crevice 13a has forced central hole 2a, thereby, the optical disk 2 has structure by which chucking is certainly carried out to spindle section 12a.

[0017] Therefore, advantage ****, like since two or more chucking pawls 13 energized elastically were formed in spindle section 12a of a turntable 12 as a disk chucking means, while it becomes unnecessary to prepare a clamper above a turntable 12 like before, and the structure of disk chucking becomes easy and becoming a thin form, the control at the time of carrying out chucking also becomes simple.

[0018] Moreover, in body of optical disk driving gear 10A, the optical pickup 20 which reads signal side 2c in the playback side 2b side of an optical disk 2 is formed free [straight-line migration in the direction of a path of an optical disk 2 (an arrow head X1, X 2-way)]. In the initial state, it is located

and this optical pickup 20 is standing by so that the lead-in groove area by the side of the inner circumference of an optical disk 2 (not shown) can be countered. The laser beam from the laser diode 22 prepared in the box 21 interior passes beam SUPURITA 23, outgoing radiation of the above-mentioned optical pickup 20 is carried out from an objective lens 24, the laser beam by which outgoing radiation was carried out is reflected by signal side 2c of an optical disk 2, incidence of it is again carried out to an objective lens 24, and image formation is carried out to the quadrisection photodiode 26 through beam SUPURITA 23 and a cylindrical lens 25. Under the present circumstances, when an objective lens 24 moves up and down to an arrow head Y1 and Y 2-way with the focal coil 27, a focus servo operates. When the laser beam by which outgoing radiation was carried out from the objective lens 24 is able to take a focus (focusing point) to signal side 2c of an optical disk 2 by this focus servo, the focal signal F of the linear property shown in drawing 2 is outputted from the quadrisection photodiode 26. The property of the above-mentioned focal signal F is regulated by few [the range where an objective lens 24 can move up and down to an arrow head Y1 and Y 2-way with the focal coil 27] range. When the optical disk 2 which does not have curvature usual is laid in the condition of having stuck to installation section 12b of a turntable 12, It is set up so that an objective lens 24 can move up and down about $\pm 0.7\text{mm}$ on the basis of signal side 2c of an optical disk 2, an objective lens 24, and the distance of a between, and in this successive range, the output from the quadrisection photodiode 26 serves as a linear. Moreover, the nonlinear out focus signal FO is outputted out of the successive range of an objective lens 24.

[0019] Moreover, when a turntable 12 is equipped with an optical disk 2 and the optical disk 2 has stopped the conditions on which the focus servo of an optical pickup 20 operates, and while the optical disk 2 is rotating, it operates, in order that the focus servo at the time of a halt may judge that the quality of chucking to the turntable 12 of an optical disk 2 mentions later, it operates, and a focus servo operates, in order that the focus servo at the time of a revolution may read signal side 2c of an optical disk 2. By the way, since it is regulated slightly, if playback side 2b of an optical disk 2 is not laid in the condition of having stuck to installation section 12b of a turntable 12, it will separate from the range where an objective lens 24 can move up and down to an arrow head Y1 and Y 2-way with the focal coil 27 from a FUOKA servo field. That is, where mistake chucking of the optical disk 2 is carried out to a turntable 12, playback side 2b of an optical disk 2 will be stuck to installation section 12b of a turntable 12, and the out focus signal FO will be outputted from the quadrisection photodiode 26, so that it may mention later.

[0020] Then, it connects with the chucking judging means 28 (it is hereafter described as the chucking judging circuit 28), and the output signal from the quadrisection photodiode 26 judges whether chucking of the optical disk 2 was normally carried out to the turntable 12 here. That is, the focal signal F was inputted, it judged with chucking of the optical disk 2 having been normally carried out to the turntable 12 at the case, on the other hand, the out focus signal FO was inputted, and it has judged with mistake chucking having been carried out to the case. Only when the optical disk 2 has suspended this judgment actuation, the chucking judging circuit 28 operates. In addition, for an optical pickup 20, although the tracking servo of an objective lens 24 is operating so that the tracking of the objective lens 24 can be slightly carried out in the direction of a path in inside when an optical disk 2 rotates and signal side 2c of an optical disk 2 is read from the objective lens 24, a detailed description is omitted.

[0021] Next, drawing 1 thru/or drawing 3 (A), and (B) are used together and explained about actuation of chucking equipment 1A to the turntable of the optical disk of the 1st example by the above-mentioned configuration.

[0022] If fitting of the central hole 2a of an optical disk 2 is normally carried out to spindle section 12a of a turntable 12 as shown in drawing 3 (A) Central hole 2a is pushed on crevice 13a (drawing 1) of two or more chucking pawls 13 elastically formed in spindle section 12a free [an attitude], and chucking is firmly carried out. And since it is hard coming to escape central hole 2a by upper lobe 13b (drawing 1), playback side 2b of an optical disk 2 sticks and contacts installation section 12b of a turntable 12, and will be in the condition that chucking of the optical disk 2 was normally carried out to the turntable 12. Here, the focus servo of an optical pickup 20 is operated in the state of the initial

position where it is the idle state before an optical disk 2 rotates, and the optical pickup 20 countered the lead-in groove area by the side of the inner circumference of an optical disk 2 (not shown). That is, an objective lens 24 is operated to an arrow head Y1 and Y 2-way with the focal coil 27 in the optical pickup 20 shown in drawing 1. Under the present circumstances, since playback side 2b of an optical disk 2 sticks and is in contact with installation section 12b of a turntable 12. The distance of an objective lens 24 and signal side 2c of an optical disk 2 becomes in the successive range of an objective lens 24. And it becomes in a focus servo field and the focus of the laser beam by which outgoing radiation was carried out from the objective lens 24 can be carried out to signal side 2c of an optical disk 2, and the focal signal F shown in drawing 2 is outputted from the quadrisection photodiode 26, and is inputted into the chucking judging circuit 28. Since the chucking judging circuit 28 judges with the ability of the laser beam by which outgoing radiation was carried out from the objective lens 24 to have taken the focus normally to signal side 2c of an optical disk 2, an optical disk 2 judges that chucking was normally carried out to the turntable 12 by it here. Thereby, the chucking judging circuit 28 can do ** which tells the information which carried out chucking normally into body of equipment 10A. And signal side 2c of an optical disk 2 is read, making a turntable 12 and one carry out the high-speed revolution of the optical disk 2 by the motor 11, and making the straight-line migration of the optical pickup 20 carry out in the direction of a path (an arrow head X1, X 2-way), after being judged with chucking having been carried out normally.

[0023] next, as shown in drawing 3 (B), when fitting of the central hole 2a of an optical disk 2 is carried out in the condition of having hooked on spindle section 12a of a turntable 12 aslant. Since two or more chucking pawls 13 formed in spindle section 12a enter in central hole 2a of an optical disk 2 at imperfection. While an optical disk 2 will be in the condition of escaping from it and being easy to come out of spindle section 12a, playback side 2b of an optical disk 2 loses touch with installation section 12b of a turntable 12 in part, and an optical disk 2 will be in the condition that mistake chucking was carried out to the turntable 12. Here, the focus servo of an optical pickup 20 is operated in the state of the initial position where it is the idle state before an optical disk 2 rotates, and the optical pickup 20 countered the lead-in groove area by the side of the inner circumference of an optical disk 2 (not shown). Under the present circumstances, since playback side 2b of an optical disk 2 has lost touch with installation section 12b of a turntable 12 in part, the distance of an objective lens 24 and signal side 2c of an optical disk 2 becomes the outside of the successive range of an objective lens 24, and will be in the condition that the focus of the laser beam by which outgoing radiation was carried out cannot be carried out to signal side 2c of an optical disk 2 from an objective lens 24. namely, when signal side 2c of an optical disk 2 separates from an objective lens 24 extremely or signal side 2c of an optical disk 2 approaches an objective lens 24 extremely. It becomes the outside of a focus servo field by that to which the successive range of an objective lens 24 carries out small and which it suits as mentioned above. The focus of the laser beam by which outgoing radiation was carried out from the objective lens 24 cannot be carried out to signal side 2c of an optical disk 2, but the out focus signal FO shown in drawing 2 is outputted from the quadrisection photodiode 26. Therefore, the chucking judging circuit 28 chooses predetermined time amount at its own discretion, and since it judges with the ability of the laser beam by which outgoing radiation was carried out from the objective lens 24 here to have not taken the focus to signal side 2c of an optical disk 2, it judges with mistake chucking of the optical disk 2 having been carried out to the turntable 12. Thereby, a user can also be told about it with the warning means which is not illustrated while the chucking judging circuit 28 tells the information which carried out mistake chucking into body of equipment 10A.

[0024] Therefore, in chucking equipment 1A to the turntable of the optical disk of the 1st example, since a fear of damaging the expensive optical disk 2 since it can judge with mistake chucking of the optical disk 2 having been carried out to the turntable 12 before carrying out revolution actuation of the optical disk 2 also disappears and the configuration member in body of optical disk driving gear 10A is not damaged, either, it can contribute to the quality of chucking equipment 1A to the turntable of an optical disk, and an optical disk 2, and the improvement in dependability. Of course, when chucking of the optical disk 2 is certainly carried out to a turntable 12, an optical disk 2 can be certainly read by the

optical pickup 20.

[0025] A perspective view for <2nd example> drawing 4 to explain the chucking equipment to the turntable of the optical disk of the 2nd example concerning this invention and drawing 5 (A) - (D) are the mimetic diagrams for explaining actuation of the chucking equipment to the turntable of the optical disk of this 2nd example. In addition, while attaching the same sign to the same configuration member as the 1st example which explanation showed previously for convenience and explaining if needed, a new sign is attached and explained to a new configuration member.

[0026] Using chucking equipment 1A to the turntable of the optical disk of the 1st example, chucking equipment 1B to the turntable of the optical disk of the 2nd example is constituted so that chucking of the optical disk 2 may be automatically carried out to a turntable 12 at flume 3A and one, and it is explained focusing on a point different here from the 1st example.

[0027] In chucking equipment 1B to the turntable of the optical disk of the 2nd example concerning this invention shown in drawing 4, it is beforehand equipped with the optical disk 2 on tray 3A, and it is contained in the state of two or more laminatings in the magazine which is not illustrated. And if it inserts the whole magazine into body of optical disk driving gear 10B, tray 3A equipped with the desired optical disk 2 is pulled out selectively, and after chucking of the optical disk 2 is automatically carried out to the turntable 12 in body of equipment 10B and chucking is normally carried out to tray 3A and one, it is constituted so that tray 3A may evacuate from a turntable 12 and may read signal side 2a of the desired optical disk 2 by the optical pickup 20. In addition, in the following explanation, explanation is omitted about the configuration member which pulls out selectively tray 3A which equipped with the desired optical disk 2 from the magazine.

[0028] That is, the fabricating operation of the above-mentioned tray 3A is carried out to abbreviation rectangle tabular in one using resin material etc., an optical disk 2 turns to the abbreviation center section by the side of top-face 3a of tray 3A outer-diameter twist 1, and the big circular crevice three a1 is formed, and in this circular crevice three a1, playback side 2b of an optical disk 2 is turned down from the upper part, and it is equipped with the optical disk 2. Therefore, 2d of protective coat sides from which signal side 2c of an optical disk 2 is protected is exposed in the upper part. Moreover, the ellipse hole three b1 which the turntable 12 and optical pickup 20 in body of equipment 10B face corresponding to the circular crevice three a1 is drilled in the underside 3b side of tray 3A.

[0029] Moreover, the grasping members 4A and 4B (it is hereafter described as the disk grasping levers 4A and 4B) of the couple which grasps periphery section 2e of an optical disk 2 are formed in the top-face 3a side of tray 3A free [rotation]. These disk grasping levers 4A and 4B are installed so that central hole 2a of an optical disk 2 may be mostly countered mutually as symmetry near the periphery section of the circular crevice three a1 of tray 3A, and they are installed in the flabellate form crevice three a2 by the side of top-face 3a, and three a3. Furthermore, the disk grasping levers 4A and 4B are energized by torsion springs 6A and 6B centering on Shafts 5A and 5B. The grasping sections 4a and 4a with a stage formed in the end section are always pressing periphery section 2e of an optical disk 2 according to the energization force of torsion springs 6A and 6B. The grasping release lever sections 4b and 4b formed in the end section and the other end through Shafts 5A and 5B have attended the U-shaped notching section 3c1 formed in the side faces 3c and 3d of tray 3A, and 3d1. If it can attach and detach now at the time of the actuation which the grasping lever discharge members 30A and 30B by the side of body of equipment 10B mention later in these grasping release lever sections 4b and 4b and the grasping lever discharge members 30A and 30B contact the grasping release lever sections 4b and 4b, grasping of an optical disk 2 can be canceled.

[0030] Moreover, it connects [side faces / 3c and 3d] from top-face 3a of tray 3A, U-shaped crevice 3ac and 3ad are mostly formed in the location of a graphic display, respectively by making central hole 2a of an optical disk 2 into the symmetry, and it can be engaged now free [attachment and detachment] at the time of the actuation which the tray vertical-movement members 31A and 31B by the side of body of equipment 10B mention later to these U-shaped crevice 3ac(s) and 3ad. These tray vertical-movement members 31A and 31B are equipped with the function to which tray 3A equipped with an optical disk 2 is moved so that the turntable 12 by the side of body of equipment 10B may be approached.

[0031] The grasping lever discharge members 30A and 30B and the tray vertical-movement members 31A and 31B by the side of the above-mentioned body of equipment 10B are connected to each cam groove (not shown) formed in the single cam wheel 32 using connection means, such as a link mechanism (not shown).

[0032] Moreover, like the 1st example in body of equipment 10B, it is prepared free [a revolution of the turntable 12 which equipped shaft 11a of a motor 11 with two or more chucking pawls 13], and an optical pickup 20 is straight-line movable ***** to the direction of the direction of a path (arrow heads X1 and X2) of an optical disk 2. The chucking judging circuit (chucking judging means) 28 which judges the quality of chucking to the turntable 12 of an optical disk 2 by the FUOKA servo of an objective lens 24 also to this optical pickup 20 is formed.

[0033] Next, actuation of chucking equipment 1B to the turntable of the optical disk of the 2nd example by the above-mentioned configuration is explained using drawing 4 and drawing 5 (A) - (D).

[0034] If tray 3A which equipped with the desired optical disk 2 from the magazine which is not illustrated is selectively pulled out to the location above a turntable 12 which stands by as shown in drawing 5 (A) On pulled-out tray 3A, playback side 2b of an optical disk 2 is exposed in part from the ellipse hole three b1 of tray 3A, a downward turntable 12 and a downward optical pickup 20 are countered, and periphery section 2e of an optical disk 2 is grasped by the disk grasping levers 4A and 4B. Under the present circumstances, central hole 2a of an optical disk 2 is pulled out to the location which agrees with spindle section 12a of a turntable 12 mostly so that the turntable 12 and optical pickup 20 by the side of downward body of equipment 10B can enter in the ellipse hole three b1.

[0035] The tray vertical-movement members 31A and 31B by the side of body of equipment 10B engage with U-shaped crevice 3ac formed in the side faces 3d and 3e (drawing 4) which counter mutually [pulled-out tray 3A] here, and 3ad (drawing 4). If it moves carrying out the abbreviation synchronization of these tray vertical-movement members 31A and 31B caudad, as shown in drawing 5 (B), the playback side 2b side of an optical disk 2 will result in the condition of contacting parallel mostly at installation section 12b of a turntable 12 at tray 3A and one.

[0036] In the condition which showed in drawing 5 (B), central hole 2a of an optical disk 2 fits into spindle section 12a of a turntable 12, and playback side 2b of an optical disk 2 sticks and contacts installation section 12b of a turntable 12. At this time, playback side 2b of an optical disk 2 is forced in the direction of installation section 12b of a turntable 12 by the tray vertical-movement members 31A and 31B until chucking is certainly carried out to two or more chucking pawls 15 in which central hole 2a of the optical disk 2 which fitted into spindle section 12a carried out elastic energization and which it formed in spindle section 12a. If the focus servo of an optical pickup 20 is operated in the state of the initial position where it is the idle state before an optical disk 2 rotates here, and the optical pickup 20 countered the lead-in groove area by the side of the inner circumference of an optical disk 2 (not shown) Since playback side 2b of an optical disk 2 sticks and is in contact with installation section 12b of a turntable 12 It becomes in the successive range of an objective lens 24, and becomes in a focus servo field, and the focus of the laser beam by which outgoing radiation was carried out from the objective lens 24 can be carried out to signal side 2c of an optical disk 2, and as shown in drawing 1 and drawing 2 , the focal signal F is outputted from the quadrisection photodiode 26. Therefore, it judges with the optical disk 2 having carried out chucking of it to the turntable 12 normally, since the laser beam by which outgoing radiation was carried out from the objective lens 24 judged that the chucking judging circuit 28 has taken the focus normally to signal side 2c of an optical disk 2. And if the grasping lever discharge members 30A and 30B are operated and the grasping release lever sections 4b and 4b (drawing 4) of the disk grasping levers 4A and 4B are pressed after chucking is carried out normally, an optical disk 2 will result in the condition of being separable from tray 3A. And if the tray vertical-movement members 31A and 31B are moved further caudad from this condition, it will result in the condition which showed in drawing 5 (C).

[0037] In the condition which showed in drawing 5 (C), only the optical disk 2 was laid on the turntable 12, and tray 3A has evacuated under the turntable 12. Here, the grasping lever discharge members 30A and 30B are maintaining the condition [having pressed the grasping release lever sections 4b and 4b

(drawing 4) of the disk grasping levers 4A and 4B]. Then, the optical pickup 20 which attended the ellipse hole three b1 of tray 3A was operated, and signal side 2c of an optical disk 2 is read through the optical pickup 20.

[0038] Next, while an optical disk 2 will be in the condition of escaping from it and being easy to come out of spindle section 12a, like the 1st example when mistake chucking of the optical disk 2 is carried out to a turntable 12 by a certain reason as shown in drawing 5 (D), playback side 2b of an optical disk 2 will lose touch with installation section 12b of a turntable 12 in part. At this time, the optical disk 2 has maintained the condition of having been grasped by the disk grasping levers 4A and 4B. here, since the laser beam by which outgoing radiation was carried out changed into the condition that a focus cannot be carried out to signal side 2c of an optical disk 2 from the objective lens 24 when the focus servo of an optical pickup 20 was operated in the state of the initial position where it is the idle state before an optical disk 2 rotates, and the optical pickup 20 countered the lead-in groove area by the side of the inner circumference of an optical disk 2 (not shown), it was shown in drawing 1 and drawing 2 -- as -- the out focus signal FO -- **** from the quadrisection photodiode 26 -- last ** Therefore, since it judges with the ability of the laser beam by which the chucking judging circuit 28 chose predetermined time amount at its own discretion, and outgoing radiation was carried out from the objective lens 24 to have not taken the focus to signal side 2c of an optical disk 2, it judges with mistake chucking of the optical disk 2 having been carried out to the turntable 12. Then, the tray vertical-movement members 31A and 31B are moved up, an optical disk 2 is removed from a turntable 12, the tray vertical-movement members 31A and 31B are moved caudad again, and chucking is performed again. And when it is judged with mistake chucking also after repeating chucking like the following and repeating the count of predetermined (for example, 5 times), when judged with mistake chucking by the chucking judging circuit 28, the body of equipment 10B side is told about a mistake chucking condition.

[0039] therefore, in chucking equipment 1B to the turntable of the optical disk of the 2nd example While being able to acquire the same effectiveness as the 1st example, when carrying out chucking of the optical disk 2 to a turntable 12 automatically especially at tray 3A and one, Since chucking was repeatable again, and abnormalities were told when it was mistake chucking also after the count repetition of predetermined even if it carried out mistake chucking, it can contribute to the improvement in the engine performance of chucking equipment 1B to the turntable of an optical disk.

[0040] A perspective view for <3rd example> drawing 6 to explain the chucking equipment to the turntable of the optical disk of the 3rd example concerning this invention and drawing 7 (A) - (D) are the mimetic diagrams for explaining actuation of the chucking equipment to the turntable of the optical disk of this 3rd example. In addition, while attaching the same sign to the same configuration member as the 1st example and the 2nd example of explanation which were shown previously for convenience and explaining if needed, a new sign is attached and explained to a new configuration member.

[0041] Although constituted from chucking equipment 1C to the turntable of the optical disk of the 3rd example by the almost same technical thought as chucking equipment 1B to the turntable of the optical disk of the 2nd example, it is only that tray 3B of the 3rd example differs from tray 3A of the 2nd example in part, and the directions which tray 3B evacuates from a turntable 12 according to this differ especially.

[0042] In chucking equipment 1C to the turntable of the optical disk of the 3rd example shown in drawing 6 , tray 3B reverses top-face 3a and underside 3b of tray 3A which were explained in the 2nd example. Therefore, underside 3a of tray 3B carries out an abbreviation response with top-face 3a of tray 3A, and top-face 3b of tray 3B carries out an abbreviation response with underside 3b of tray 3A, and it is constituted. Moreover, a playback side 2b side exposes thoroughly the optical disk 2 with which it equipped in the circular crevice three a1 of tray 3B, 2d side of protective coat sides turns to top-face 3b of tray 3B central hole 2a twist 1 on the basis of central hole 2a of an optical disk 2, and the recess hole three b2 of a big path penetrates, and it is drilled while it is in contact with the circular crevice three a1.

[0043] On the other hand by the body of optical disk driving gear 10C side, it is prepared in shaft 11a of a motor 11 like the 1st and 2nd example free [a revolution of the turntable 12 equipped with two or more chucking pawls 13], and an optical pickup 20 is straight-line movable ***** to the

direction of the direction of a path (arrow heads X1 and X2) of an optical disk 2. The chucking judging circuit (chucking judging means) 28 which judges the quality of chucking to the turntable 12 of an optical disk 2 by the FUOKA servo of an objective lens 24 also to this optical pickup 20 is formed.

[0044] Next, actuation of chucking equipment 1C to the turntable 12 of the optical disk 2 of the 3rd example shown in drawing 7 (A) - (D) Drawing 5 (A) As it was made corresponding to - (D) and was especially shown in drawing 7 (A) It is pulled out to the location where playback side 2b of an optical disk 2 is thoroughly exposed, and counters with the turntable 12 by the side of downward body of equipment 10B, and an optical pickup 20, and central hole 2a of an optical disk 2 agrees with spindle section 12a of a turntable 12 mostly. Moreover, as shown in drawing 7 (B), it results in the condition that playback side 2b of an optical disk 2 contacts parallel mostly at installation section 12b of a turntable 12 at tray 3B and one, and is judged with the optical disk 2 having carried out chucking to the turntable 12 normally by the chucking judging circuit 28. Moreover, as shown in drawing 7 (C), after chucking of the optical disk 2 is certainly carried out to a turntable 12, the point which tray 3B has evacuated in the upper part of a turntable 12 differs from the 2nd example here. Furthermore, since it is judged with the optical disk 2 having carried out mistake chucking to the turntable 12 by the chucking judging circuit 28 when mistake chucking of the optical disk 2 is carried out to a turntable 12 by a certain reason as shown in drawing 7 (D), when it is judged with mistake chucking also after repeating chucking like the 2nd example and repeating the count of predetermined (for example, 5 times), the body of equipment 10C side is told about the mistake chucking condition. Therefore, the same effectiveness as the 2nd example can be acquired also in the 3rd example.

[0045] In addition, although explanation and a graphic display were performed [pulling out selectively tray 3A or tray 3B which equipped with the desired optical disk 2 from the magazine (not shown), and] in the 2nd and 3rd example which carried out [above-mentioned] the configuration Tray 3A or tray 3B which equipped with the optical disk 2 in the magazine is contained in the state of two or more laminatings, without restricting to this. Insert this magazine into body of optical disk driving gear 10B, and 10C, and disassemble a magazine in the inserted location, extend laminating spacing of tray 3A or tray 3B, and a turntable 12, an optical pickup 20, etc. are inserted in that location. The configuration which carries out chucking of the optical disk 2 on a turntable 12 is also possible.

[0046] In addition, although it constituted from the 1st - the 3rd example so that chucking of the optical disk 2 might be carried out to a turntable 12 with two or more chucking pawls 13 elastically formed in spindle section 12a of a turntable 12 free [an attitude] You may constitute so that it may press near the central hole 2a of an optical disk 2 from the upper part by the clamper shown in the conventional example and chucking of the optical disk 2 may be carried out to a turntable 12. What is necessary is just to operate the chucking judging circuit (chucking judging means) 28 by the optical pickup 20, also when a clamper is used.

[0047]

[Effect of the Invention] Since according to the chucking equipment to the turntable of the optical disk concerning this invention concerning this invention explained in full detail above a fear of damaging an expensive optical disk since it can judge with mistake chucking of the optical disk having been carried out to the turntable also disappears and the configuration member within the body of an optical disk driving gear is not damaged in claim 1 publication, either, before carrying out revolution actuation of the optical disk, it can contribute to the quality of the chucking equipment to the turntable of an optical disk, and an optical disk, and the improvement in dependability. Of course, when chucking of the optical disk is certainly carried out to a turntable, an optical disk can be certainly read by the optical pickup.

[0048] Moreover, in claim 2 publication, since chucking was repeatable again, and abnormalities were told [while being able to acquire the same effectiveness as claim 1 publication] when it was mistake chucking also after the count repetition of predetermined even if it carried out mistake chucking in case chucking of the optical disk was especially carried out to a turntable automatically at a tray and one, it can contribute to the improvement in the engine performance of the chucking equipment to the turntable of an optical disk.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the sectional side elevation having shown the chucking equipment to the turntable of the optical disk of the 1st example concerning this invention.

[Drawing 2] It is drawing having shown the focal property of the optical pickup shown in drawing 1 .

[Drawing 3] It is a mimetic diagram for explaining actuation of the chucking equipment to the turntable of the optical disk of the 1st example concerning this invention, and drawing in which (A) showed the normal chucking condition, and (B) are drawings having shown the mistake chucking condition.

[Drawing 4] It is a perspective view for explaining the chucking equipment to the turntable of the optical disk of the 2nd example concerning this invention.

[Drawing 5] (A) - (D) is a mimetic diagram for explaining actuation of the chucking equipment to the turntable of the optical disk of the 2nd example concerning this invention.

[Drawing 6] It is a perspective view for explaining the chucking equipment to the turntable of the optical disk of the 3rd example concerning this invention.

[Drawing 7] (A) - (D) is a mimetic diagram for explaining actuation of the chucking equipment to the turntable of the optical disk of the 2nd example concerning this invention.

[Drawing 8] It is the sectional side elevation having shown an example of the chucking equipment to the turntable of the conventional optical disk, and drawing in which (A) showed the block diagram and (B) showed the normal chucking condition, and (C) are drawings having shown the mistake chucking condition.

[Description of Notations]

1A, 1B, 1C [-- A signal side, 2e / -- The periphery section, 3A, 3B / -- A tray 4A, 4B / -- A grasping member (disk grasping lever), 12 / -- A turntable 12a / -- The spindle section, 13 / -- A chucking pawl, 20 / -- An optical pickup 24 / -- An objective lens 28 / -- Chucking judging means (chucking judging circuit).] -- The chucking equipment to the turntable of an optical disk, 2 -- An optical disk, 2a -- A central hole, 2c

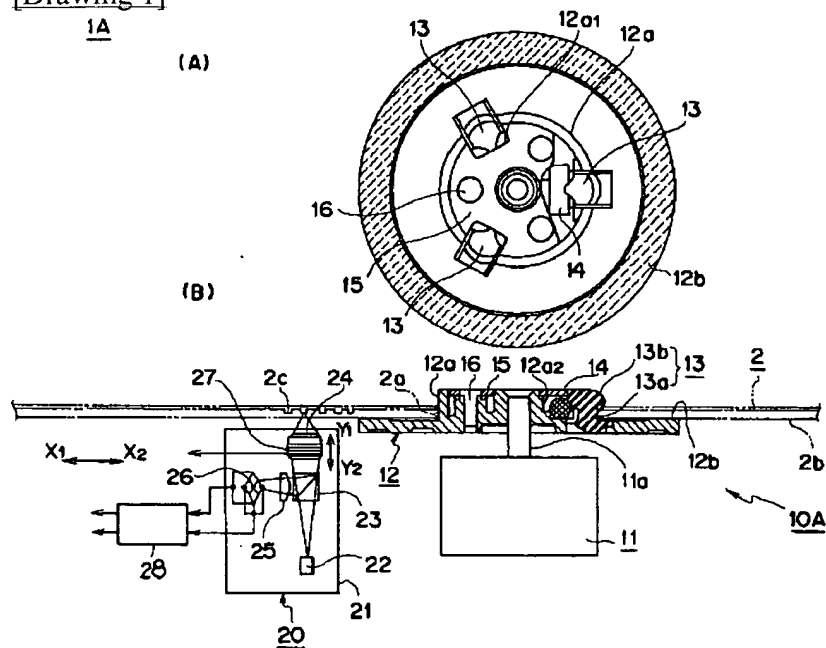
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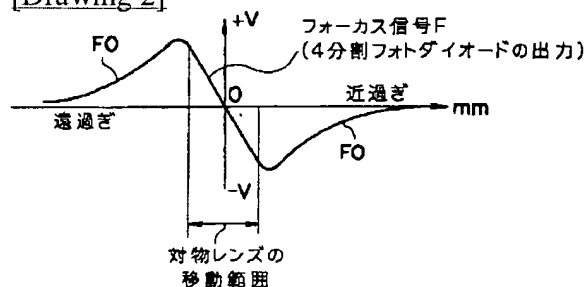
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[Drawing 1]

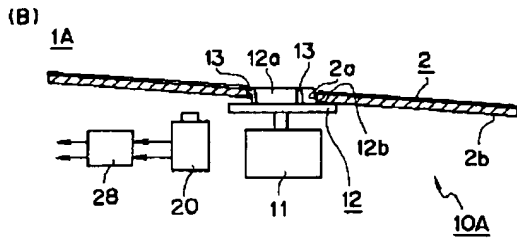
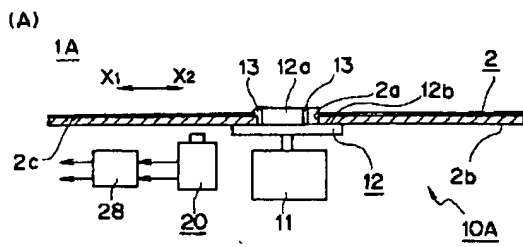
1A



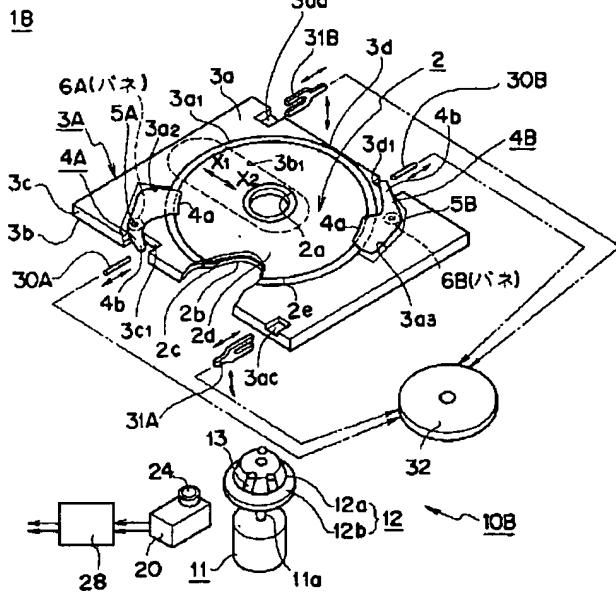
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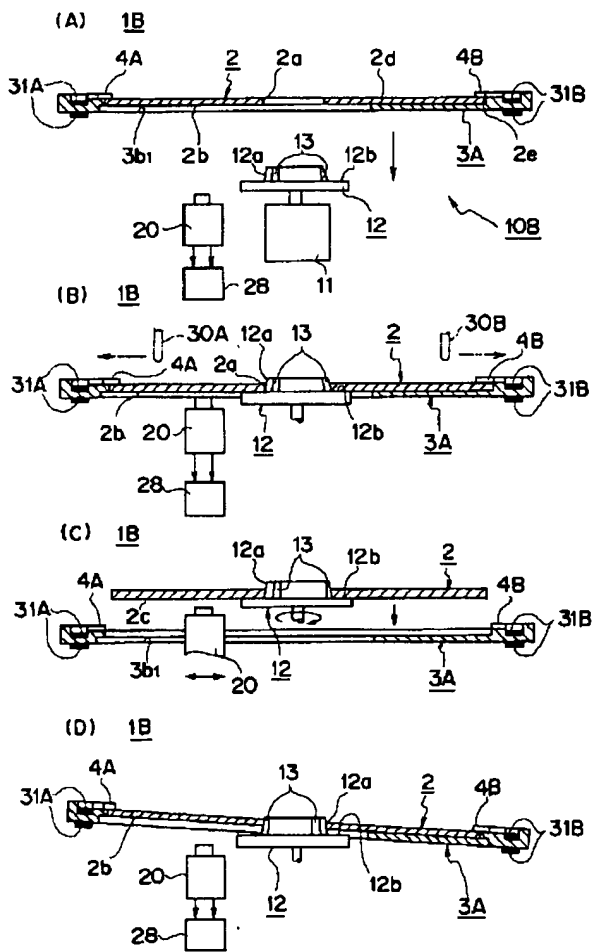
[Drawing 3]



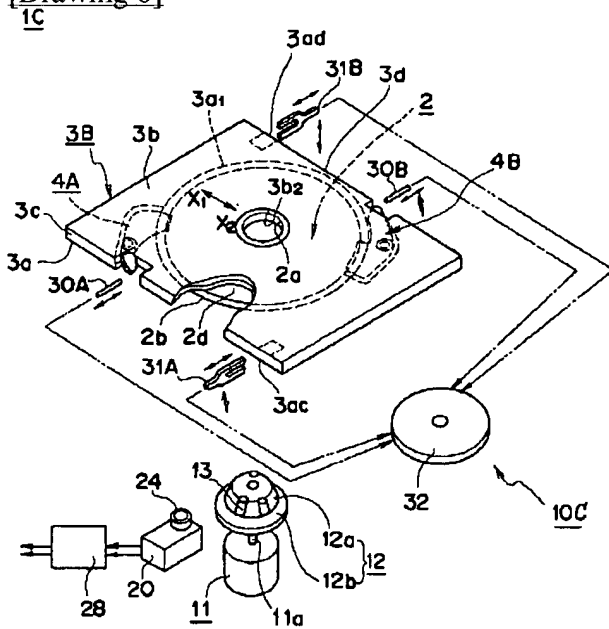
[Drawing 4]



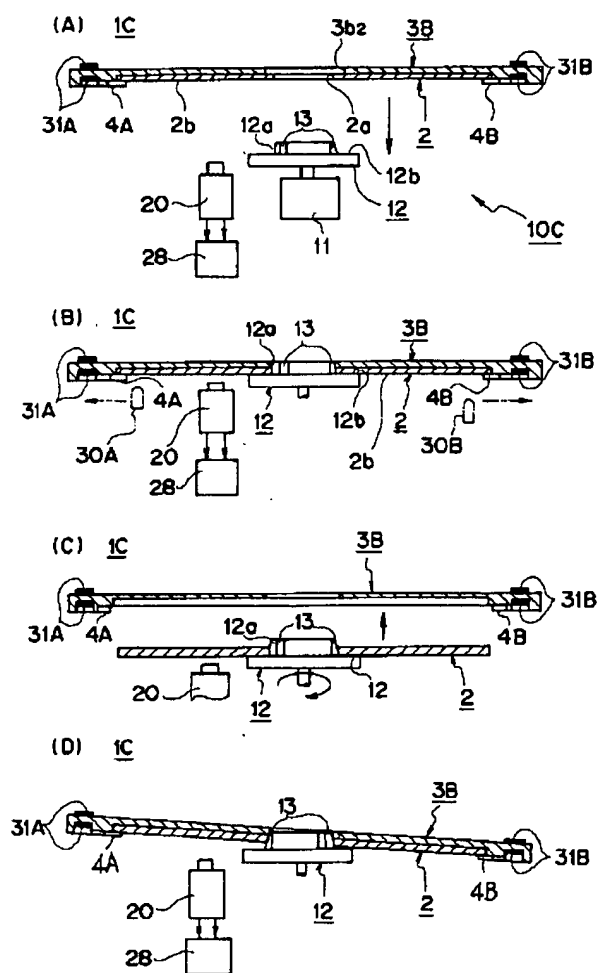
[Drawing 5]



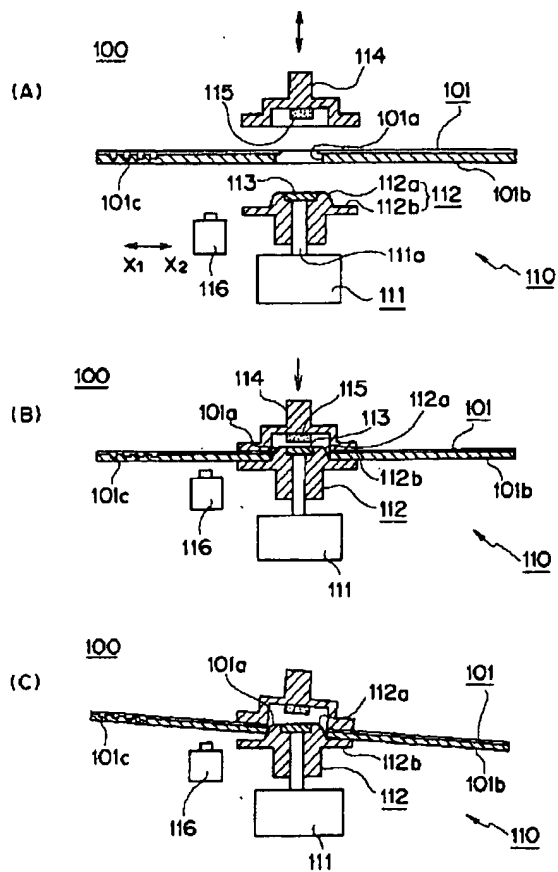
[Drawing 6]



[Drawing 7]



[Drawing 8]



[Translation done.]